

REMARKS

Claims 1-22 have been canceled. New Claims 23-46 are active in the case.

Reconsideration is respectfully requested.

Applicants' representative wishes to thank Examiner Kiliman for the helpful and courteous interview of November 22, 2005. As a result of the discussion it is believed that the issues in the case have been clarified and that the prosecution of the case has been materially advanced.

The present invention relates to a composite powder that has a matrix/domain structure.

Specification Amendments

The specification has been amended to provide the same with appropriate section headings. Further, the text has been amended on page 4 in order to correct a minor, obvious error. Further the table of page 15 has been resubmitted in order to correct the unit of the volume specific surface in the second column. Entry of the amendments into the record is respectfully requested.

Claim Amendments

Claims 1-22 have been canceled in favor of new Claims 23-25 and 28-45, which new claims improve upon the language of the original claims. Accordingly, support for the specified newly presented claims can be found in the original claims. New Claims 26 and 27 are supported by the specification in the paragraph bridging pages 4 and 5 and page 4, lines 23-26

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of the text. New Claim 46 is a combination of new Claims 23 and 36. Entry of the newly presented claims is respectfully requested.

Claim Rejection, 35 USC 112 and 35 USC 101

The issue raised with respect to Claim 22 is obviated by the cancellation of Claim 22 in favor of new Claim 45. Withdrawal of the rejection is respectfully requested.

Invention

The present invention is directed to a composite powder having a matrix domain structure, that comprises a matrix of a metal oxide that is present in the composite powder in the form of three-dimensional aggregates that have at least in one dimension a diameter of not more than 250 nm, domains that consist of metal oxides and/or noble metals in said matrix of an individual metal oxide, wherein the domains of nanoscale dimensions consist of at least two metal oxides or at least two noble metals or a mixture of at least one metal oxide and at least one noble metal, and the composite powder has a volume-specific surface of 60 to 1200 m²/cm³ and exists as a matrix/domain structure.

Obviousness Ground of Rejection

Claims 1-22 stand rejected based on 35 USC 103(a) as obvious over Oshima '507 in view of Ritter '699, Kogoi '002 and Gottfried '767. This ground of rejection is respectfully traversed.

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The Oshima patent is relevant to the present invention insofar as it discloses a ultraviolet shielding composite oxide material that is said to be comprised of matrix particles comprised of primary particles that have an average particle diameter ranging from 0.001 to 0.3 μm and daughter particles that have a particle diameter ranging from 0.001 to 0.1 μm . Thus, the particle size ranges of the matrix particles and the daughter particles are virtually the same (see the Summary of the Invention and col 12, lines 53-56 of the patent).

The patent, in columns 12 and 13, provides a discussion of the daughter particles and in lines 38-39 provides specific examples of metal oxides including three titanates, and indeed a carbide, that constitute the daughter particles. However, the gist of the patent is that it is directed to an ultraviolet shielding composite of fine particles, wherein the domain or daughter particles and the matrix particles are selected so that the particles that constitute the matrix particles have a band gap energy larger than that of the daughter particles in order for the daughter particles to effectively exhibit the scattering and absorption of UV light. Accordingly, when using aggregates of fine TiO_2 particles as the matrix particles and fine ZnO particles that have a band gap energy smaller than that of TiO_2 , as the daughter particles, the UV light having a wavelength of not more than 320 nm is absorbed by exciton absorption that corresponds to a band gap energy of the particles that constitute the matrix particles, i.e., TiO_2 (col 7, lines 35-55). (Only a relative few oxides are disclosed as acceptable semiconductive compounds that have a band gap energy within an acceptable range. The examples of the text only provide examples of zinc oxide, titanium oxide and cerium oxide daughter particles in a matrix oxide. Nowhere, however, does the patent clearly disclose or suggest a composite oxide material, as presently claimed, wherein a matrix oxide contains domains of nanoscale dimensions that consist of (i)

at least two metal oxides, (ii) at least two noble metals or (iii) a mixture of at least one metal oxide and at least one noble metal, with the composite powder having a volume-specific surface of 60 to 1200 m²/cm³. The patent nowhere shows or suggests a noble metal as a component of a domain material.

The Ritter et al patent, which is discussed on page 2 of the present text, describes the production of a matrix/domain structure of superparamagnetic domains in a dielectric matrix. As mentioned in the text, a disadvantage is that the oxide structure must be made by the sol-gel process which is not only tedious, and may involve long periods of time to form the oxide product, but also a hydrogenation treatment is required at uneconomically high temperatures (see the example as described in columns 3 and 4 of the patent) Further, additional process steps as described in the patent increase the possibility of introducing impurities into the mixed oxide product.

It also must be observed that the patent is limited to the preparation of a mixed oxide material of a silicon dioxide matrix which contains domains of iron oxide. As described at the bottom of column 3 of the patent, the as-cured gel material that is obtained is paramagnetic, which gel may be processed to provide a product of superparamagnetic, ferromagnetic or ferrimagnetic particles in a non-magnetic silicon dioxide matrix. The patent therefore contains no description of the claimed product of the present invention of a matrix oxide that contains domains of nanoscale dimensions that consist of (i) at least two metal oxides, (ii) at least two noble metals or (iii) a mixture of at least one metal oxide and at least one noble metal, with the composite powder having a volume-specific surface of 60 to 1200 m²/cm³. The patent nowhere shows or suggests a noble metal as a component of a domain material. Further, since the patent

only teaches a sol-gel method of forming the mixed oxide material of the reference, there is no teaching or suggestion of the method employed in the present invention, as claimed in Claim 35, of forming the product of the invention. Accordingly, the Ritter et al patent does not show or suggest the present invention, so that the rejection of the present claims based on the two combined patents is respectfully requested.

As to the matter of the Gottfried et al patent, the same discloses a composite oxide material of comprised of a non-magnetic matrix formed of a metal oxide or a metalloid oxide and domain particles of iron oxide as disclosed at column 4, lines 38-41.) The selected iron oxide domain must provide a superparamagnetic domain. Again, applicants submit that this disclosure does not suggest to one of skill in the art a composite oxide material that is constituted of a matrix oxide that contains domains of nanoscale dimensions that consist of (i) at least two metal oxides, (ii) at least two noble metals or (iii) a mixture of at least one metal oxide and at least one noble metal, with the composite powder having a volume-specific surface of 60 to 1200 m²/cm³. Accordingly, withdrawal of the rejection based on the patent is respectfully requested.

The Kogoi et al '002 patent disclosed ultrafine particles of zinc oxide having a BET surface area of about 10 to about 200 m²/g and having a substantially isotropic primary particle shape. The particles are employed as a useful additive in the production of cosmetic products. Nowhere in the reference is there any disclosure relative to the distinction between the present invention and the primary Ritter and Oshima patents that have been applied against the present claims. Accordingly, withdrawal of the obviousness ground of rejection is respectfully requested.

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It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon



Frederick D. Vastine, Ph.D.
Registration No. 27,013

Customer Number

22850

(703) 413-3000

Fax #: (703)413-2220

NFO/FDV